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November 11, 2005

Date of Deposit

Joseph A. Yosick, Reg. No. 51,062

Name of applicant, assignee or  
Registered Representative

*Joseph A. Yosick*  
Signature

11/11/05  
Date of Signature

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Intellectual Property  
Law Worldwide

Our Case No. 4865-185

Client Ref. No. 1980037

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

James W. Rudolph

Serial No.: 10/776,395

Filing Date: February 11, 2004

For: METHOD AND APPARATUS FOR  
MEASUREMENT OF WEIGHT  
DURING CVI/CVD PROCESS

Examiner: R. Gibson

Group Art Unit: 2859

## SUBSTITUTE BRIEF ON APPEAL

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

This is an appeal from the Final Rejection dated September 10, 2004.

This Substitute Brief on Appeal replaces the brief dated March 10, 2005. It is believed that no additional fee is necessary. The Commissioner is hereby authorized to

charge payment of any additional filing fee required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this communication or credit any overpayment to Deposit Account No. 23-1925.

A personal appearance for presentation of oral argument is requested. The fee was previously paid.

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## **REAL PARTY IN INTEREST**

Goodrich Corporation is the real party in interest, as assignee of this application.

## **RELATED APPEALS AND INTERFERENCES**

An appeal in a parent case (serial no. 09/178,399, appeal number 2003-1362) was previously decided. The parent case was subsequently abandoned.

## **STATUS OF CLAIMS**

Claims 15-18 stand finally rejected and are on appeal in this case.

## **STATUS OF AMENDMENTS**

A Response to the Final Office Action was mailed on November 8, 2004. Claim 15 was amended after Final Rejection. The amendment to claim 15 was initially denied entry, but was later entered. Claims 16-18 have not been amended after Final Rejection.

## **SUMMARY OF CLAIMED SUBJECT MATTER**

The present invention comprises a method and apparatus for measurement of weight during the CVI/CVD process. (Specification, title page and page 2, lines 20-22). The term CVI/CVD is intended to refer to infiltration and deposition of a matrix within a porous part or structure. (Specification, page 2, lines 20-22).

According to the present invention, a method is described to determine the weight change of parts in a furnace during a CVI/CVD process, which comprises weighing the entire furnace and its contents during the process. (Specification, page 3, lines 29-31).

The present invention describes a furnace and means for weighing the furnace. (Specification, page 3, line 32 - page 4, line 4). The weighing means preferably comprises placing the furnace on load cells. (Specification, page 4, lines 4-5). Most preferably, the load cells are placed under the furnace so that the weight of the furnace is supported by the load cells. (Specification, page 4, lines 5-9).

An indicator unit is electrically connected to the means for weighing the furnace. (Specification, page 3, line 32 page 4, line 4). The indicator unit is monitored during the CVI/CVD process for the change in weight of the furnace as the change in weight of the parts in the furnace. (Specification, page 4, lines 2-4). The indicator unit may be tared immediately before the CVI/CVD process is commenced so as to reflect the change in weight of the parts directly. (Specification, page 4, lines 31-33).

The Appellant describes and claims the monitoring of the weight change of parts in a furnace during the CVI/CVD process. (Specification, page 3, line 32, page 4, line 4). The



CVI/CVD process is terminated when the indicator unit indicates that the parts in the furnace have gained a prescribed amount of weight. (Specification, page 4, lines 16-25). The various process parameters which can be monitored include the furnace temperature, the reactant gas flow rate, the internal furnace pressure, and the reactivity of the reactant gases. (Specification, page 6, lines 3-5).

In sum, the present invention comprises a method for weighing parts being subjected to a CVI/CVD process during the process itself to indicate a weight change thereof using a particular process parameter. (Specification, page 10, lines 1-7). The process may be terminated or altered as desired based upon the weight gain information obtained. (Specification, page 10, lines 1-7),

## **GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

Whether claims are obvious under 35 U.S.C. § 103(a) as being unpatentable over Golecki et al. (U.S. Patent No. 5,348,774) in view of Yoshida et al (U.S. Patent No. 4,964,734 ), Yano et al. (U.S. Patent No. 4,375,838), Spoor (U.S. Patent No. 4,217,785), Piroozmandi (U.S. Patent No. 5,770,823) and Swartzendruber (U. S. Patent No. 4,044,920).

## ARGUMENTS OF APPELLANT

### **35 U.S.C. § 103(a) Obviousness Rejection** **Over Golecki et al. in view of a multitude of unrelated references**

Claims 15-18 have been finally rejected under 35 U.S.C. § 103(a) over Golecki et al. in view of Yoshida et al., Yano et al., Spoor, Piroozmandi, and Swartzendruber. The Examiner relies upon this improper combination to teach that Appellant's method of determining the change and weight in parts by monitoring a particular process parameter, changing such parameter to achieve the desired weight gain was known in the art. The Appellant respectfully traverses this final rejection.

The Examiner contends that Golecki et al. disclose continuously weighing the porous structure during a CVI process. The Examiner then admits that Golecki et al. do not weigh the entire furnace during their process. Rather, Golecki et al. weigh the internal support for the carbon substrates located in the furnace. The Examiner further reasons that Golecki et al. disclosed there were problems with this embodiment.

The Examiner then asserts that it is known in the weighing arts that electronic load sensors lose accuracy when exposed to fluctuating temperatures as shown by Yano and Spoor. The Examiner further reasons since heat rises and the Golecki et al. weighing chamber is attached to the top of the CVI/CVD furnace, there is a problem with the design of the weighing device of Golecki et al. that would be apparent to the ordinary practitioner in the weighing arts — namely, the loss of accuracy caused by vapor deposit buildup on the load cells and temperature induced variations on the accuracy of the load cells as the furnace begins to heat up. Yoshida et al., according to the Examiner, show that one solution to such a problem is to relocate the load cell outside of the hot chamber in order to thermally isolate

the load cell (col. 3, lines 54-59). The Examiner then concludes that presumably the same effect would be achieved by placing the load cells under the supporting legs at the furnace itself without any support in the cited references.

The Examiner then asserts that it is well known in the weighing art that an inexpensive way to retrofit a large existing device to enable it to weigh its contents is to place load cells under the supporting legs of the device as shown by the examples of Piroozmandi (col. 2, line 30 - col. 3, line 54) and Swartzendruber (col. 2, lines 50-58). Based upon this, the Examiner concludes that it would have been obvious to the ordinary practitioner in the weighing arts to modify the CVI furnace of Golecki et al. to place the load cells in the supporting legs of a CVI furnace because this would have been an inexpensive, art-recognized way to retrofit an existing large device, such as a CVI furnace, to weigh and that it would also include the advantage of placing the load cells in this location to inherently isolate the load cells from the damaging environment and temperature changes inside the furnace itself thereby increasing load cell life and accuracy.

**A. The References are Improperly Combined**

The Examiner's combination of references is erroneous. One of ordinary skill in the art would not combine the references as suggested by the Examiner. The Examiner has used the applicant's invention as an instruction book and pure blatant hindsight to reconstruct the claimed invention and call it obvious in view of the references. However, nowhere does the Examiner show in this combination that the furnace temperature is monitored and changed in order to achieve the desired weight gain as required by claim 15. Nowhere does the Examiner show that the combination of references teaches the monitoring of the reactant gas flow and changing of the gas flow in order to achieve the desired weight gain of a part as

required by claim 16. Furthermore, the Examiner does not even address monitoring the internal pressure of the furnace and changing such pressure to achieve the desired weight gain as required by claim 17. Finally, the rejection is silent as the monitoring the reactivity of the reactant gas and changing the gas flow to achieve the desired weight gain of a part as required by claim 18.

Rather, the Examiner mashes together various unrelated references. The Examiner relies upon Golecki et al. (U.S. Patent No. 5,348,774) for a method of rapidly densifying a porous structure. Golecki et al. disclose the use of an in-situ weighing device (e.g. an electronic balance) to continuously monitor the weight of the substrates and susceptor during the densification run, if desired. (Golecki et al., col. 7, lines 41-46). An electrical signal proportional to the weight is put out by the electronic balance to the power supply and/or pressure controller and/or mass flow controller so that the process conditions can be optimized and adjusted. (Golecki et al., col. 7, lines 45-53). A chamber houses the balance and is thermostatically slightly above room temperature to ensure stable operation of the balance (Golecki et al., col. 7, lines 4-10). However, as the Examiner himself even admits, Golecki et al. do not weigh the entire furnace.

The Federal Circuit has stated:

Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under section 103, teachings of references can be combined only if there is some suggestion or incentive to do so... The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. *In re Fritch*, 23 U.S.P.Q.2d 1780, 1783-84 (Fed. Cir. 1992).

One of ordinary skill in the art would not combine the teachings, of Golecki et al. dealing with a method of rapidly densifying a porous structure which are weighed with the teachings of the secondary references as suggested by the Examiner. There is absolutely no reason to combine Golecki et al. with any secondary reference as Golecki et al. describe the optional use of weighing devices.

Furthermore, there is no reason to combine the primary reference with the secondary references as they are in different fields of endeavors. The primary reference deals with weight gain of a substrate in a CVI process due to a chemical reaction. The secondary references do not deal with a method of weight gain of a substrate in a CVI process or the weighing of an entire furnace. Yoshida et al. deal with the moisture content measuring system for coal. Yano et al. disclose an electronic balance for producing a digital output signal as a measured value in response to a force induced upon a tray. Spoor describes a strain gage transducer incorporating a plurality of electrical resistance strain gages coupled together in a bridge network in order to remain zero balanced under varying temperature conditions by way of dual resistance foil type unit interposed at one of the output corners of the bridge with its two like foil resistance elements occupying adjacent arms. Piroozmandi discloses a zero height load measuring system that can be installed under a storage vessel. The Piroozmandi system is a load measuring system for measuring the load carried by a support leg. Finally, Swartzendruber teaches an apparatus for precisely measuring the weight of a large amount of feed stored in bulk feed, storage bins. The Swartzendruber apparatus include a number of electrical load cells supported upon a foundation. The weight of the bulk feed bins and any feed contained therein is supported upon the load cells by bin support legs. In response to weight induced deformation of the load cell element, electrical

signals are transmitted to electrical processing circuitry. This circuitry then device can then provide a display of weight remaining in the bin. From these brief descriptions, it is evident that not one of the secondary references relates to weighing a CVI furnace or use of a weighing device with such a furnace.

Clearly the concepts of the primary reference related to rapidly densifying porous substates by CVI are vastly different from the weighing concepts disclosed in the secondary references. Not one of the secondary references deals with a method of weight gain of a substrate in a CVI process and are consequently not in the field of the applicant's endeavors. Furthermore, as explained in the applicant's specification, determining the weight change in the parts during processing of the parts in a CVI/CVD furnace is important in order to adjust the process parameters to arrive at the desired density of the parts. Not one of the secondary references cited by the Examiner deals with such a problem that the applicant is concerned with or its solution. Consequently, one of ordinary skill in the art would not look to all weighing references as alleged by the Examiner.

Furthermore, the references themselves do not present any motivation to have them combined in the manner suggested by the Examiner nor has the Examiner shown such suggestion. Rather the Examiner is using the applicant's specification as a road map to arrive at his improper conclusions.

**B. Even if Combined, The References Do Not Render Appellant's Claims Obvious**

Even if the references were combined in the manner suggested by the Examiner, they still would not render obvious the Appellant's invention. As shown above, the combination of references does not teach the method of determining the change in weight in parts of a

furnace during a CVI/CVD process in which the weight change of the entire furnace is measured and a particular process parameter (furnace temperature, internal furnace pressure, reactivity of the reactant gas, reactant gas flow) is monitored and changed as needed to achieve the desired weight gain of the part.

**C. The Examiner allegedly relies upon “knowledge available to one of ordinary skill in the art”**

Throughout the Office Action, the Examiner asserts in piecing together a myriad of unrelated references what would actually be “knowledge available to one of ordinary skill in the art.” Applicant submits that the Examiner is not one of ordinary skill in the art. Because the Examiner is not one of ordinary skill in the art and as the references themselves do not support such a conclusion, the Examiner should not be allowed to rely upon such “alleged” knowledge.

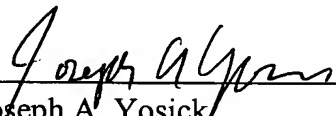


## CONCLUSION

Claims 15-18 are patentably distinguished over the multitude of cited prior art references improperly relied upon by the Examiner. The obviousness rejection of Golecki et al. in view of Yoshida et al., Yano et al., Spoor, Piroozmandi and Swartzendruber is improper because there is no motivation to combine the references as suggested by the Examiner. However, even if combined, the references do not teach Appellant's claimed invention.

In view of the foregoing discussion, it is respectfully submitted that the § 103 rejection is in error and that the final rejection should be withdrawn.

Respectfully submitted;

  
\_\_\_\_\_  
Joseph A. Yosick  
Reg. No. 51,062  
Attorney for Applicant

## CLAIMS APPENDIX

### Claims on Appeal:

Claim 15      A method to determine the change and weight of parts in a furnace during a CVI/CVD process comprising the steps of measuring the change in weight of the entire furnace, including contacts, during the CVI/CVD process, monitoring the rate of weight change, monitoring the furnace temperature, and changing the furnace temperature to achieve the desired weight gain.

Claim 16      A method to achieve a desired weight gain by determining the change and weight of parts in a furnace during a CVI/CVD process comprising the steps of measuring the change in weight of the entire furnace, including contents, during the CVI/CVD process, monitoring the rate of weight change, monitoring the reactant gas flow into said furnace and changing the reactant gas flow to achieve the desired weight gain.

Claim 17      A method to achieve a desired weight gain by determining the change and weight of parts in a furnace during a CVI/CVD process comprising the steps of measuring the change in weight of the entire furnace, including contents, during the CVI/CVD process, monitoring the rate of weight change, monitoring the internal furnace pressure and changing the internal furnace pressure to achieve the desired weight gain.

Claim 18      A method to achieve a desired weight gain by determining the change and weight of parts in a furnace during a CVI/CVD process comprising the steps of measuring the change in weight of the entire furnace, including contents, during the

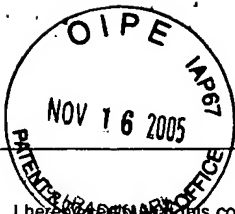
CVI/CVD process, monitoring the rate of weight change, monitoring the reactivity of the reactant gas and changing the reactant gas flow to achieve the desired weight gain.

## **EVIDENCE APPENDIX**

None

## **RELATED PROCEEDINGS APPENDIX**

Decision on Appeal for Appeal No. 2003-1362 is attached.



## CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8

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Date November 11, 2005Name: Joseph A. YosickSignature: Joseph Yosick

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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: James W. RUDOLPH Examiner:  
Serial No.: 10/776,395 R. Gibson  
Filed: 02/11/2004 Art Unit: 2859  
For: METHOD AND APPARATUS FOR MEASUREMENT OF WEIGHT DURING  
CVI/CVD PROCESS  
Attorney Docket No: 4865-185 Client Ref. No. 1980037

## TRANSMITTAL

Mail Stop: Appeal Brief - Patents  
Commissioner for Patents  
Alexandria, VA 22313-1450

Sir:

Attached are:

- ☒ Transmittal Letter (in dup); Substitute Brief On Appeal (21 pgs) including 1 copy of the Decision On Appeal (9 pgs); and  
☒ Return Receipt Postcard

## Fee calculation:

- ☐ An extension fee in the amount of \$\_\_\_\_ for a \_\_\_\_-month extension of time under 37 C.F.R. § 1.136(a).  
☐ An additional filing fee has been calculated as shown below:

					Small Entity			Not a Small Entity	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra	Rate	Add'l Fee	or	Rate	Add'l Fee
Total		Minus			x \$25=			x \$50=	
Indep.		Minus			x 100=			x \$200=	
First Presentation of Multiple Dep. Claim					+\$180=			+\$360=	
					Total	\$		Total	\$

## Fee payment:

- ☐ A check in the amount of \$\_\_\_\_ is enclosed.  
☐ Payment by credit card in the amount of \$\_\_\_\_ (Form PTO-2038 is attached).  
☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

Date

11/16/05

Joseph A. Yosick  
Joseph A. Yosick (Reg. No. 51,062)  
Attorney for Applicant



The ~~decision~~ in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 37

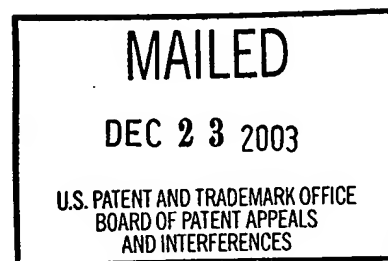
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

*Ex parte* JAMES W. RUDOLPH

Appeal No. 2003-1362  
Application No. 09/178,399

HEARD: December 11, 2003



Before BARRETT, GROSS, and BLANKENSHIP, *Administrative Patent Judges*.

GROSS, *Administrative Patent Judge*.

**DECISION ON APPEAL**

This is a decision on appeal from the examiner's final rejection of claims 1 through 14, which are all of the claims pending in this application.

Appellant's invention relates to a method and apparatus for measuring weight during a CVI/CVD process. Claim 1 is illustrative of the claimed invention, and it reads as follows:

1. A method to determine the change in weight of parts in a furnace during a CVI/CVD process, comprising the step of: measuring the change in weight of the entire furnace, including contents, during the CVI/CVD process.

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The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Swartzendruber	4,044,920	Aug. 30, 1977
Spoor	4,217,785	Aug. 19, 1980
Yano et al. (Yano)	4,375,838	Mar. 08, 1983
Yoshida et al. (Yoshida)	4,964,734	Oct. 23, 1990
Golecki et al. (Golecki)	5,348,774	Sep. 20, 1994
Piroozmandi	5,770,823	Jun. 23, 1998

Claims 1 through 14 stand rejected under 35 U.S.C. § 103 as being unpatentable over Golecki in view of Yoshida, Yano, Spoor, Piroozmandi, and Swartzendruber.

Reference is made to the Examiner's Answer (Paper No. 30, mailed September 12, 2002) for the examiner's complete reasoning in support of the rejection, and to appellant's Brief (Paper No. 29, filed August 22, 2002) and Reply Brief (Paper No. 31, filed November 13, 2002) for appellant's arguments thereagainst.

#### OPINION

As a preliminary matter, we note that appellant indicates on page 7 of the Brief that the claims do not stand or fall together. However, appellant has provided no separate argument for any claim. 37 C.F.R. § 1.192(c)(7) states:

For each ground of rejection which appellant contests and which applies to a group of two or more claims, the Board shall select a single claim from the group and shall decide the appeal as to the ground of rejection on the basis of that claim alone unless a statement is included that the claims of the group do



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not stand or fall together *and, in the argument under paragraph (c)(8) of this section, appellant explains why the claims of the group are believed to be separately patentable.* Merely pointing out differences in what the claims cover is not an argument as to why the claims are separately patentable. (Emphasis ours)

Thus, we will treat the claims as a single group with claim 1 as representative.

We have carefully considered the claims, the applied prior art references, and the respective positions articulated by appellant and the examiner. As a consequence of our review, we will affirm the obviousness rejection of claims 1 through 14.

Appellant asserts (Brief, page 9) that "[o]ne of ordinary skill in the art would not combine the references as suggested by the Examiner." More specifically, appellant contends (Brief, page 10) that "[t]here is absolutely no reason to combine Golecki with any secondary reference since Golecki describes the optional use of weighing devices." In a related argument, appellant suggests (Reply Brief, page 2) that "if Golecki wanted to weigh the entire furnace, he simply would have disclosed such an embodiment." We disagree. First, if Golecki disclosed an embodiment in which the entire furnace was weighed, Golecki would anticipate the claimed invention. If we required such a teaching in Golecki to combine other references therewith, there would be

no need for combining. Additionally, although Golecki may not specify using a weighing device as a preferred embodiment, Golecki does teach an embodiment including an in-situ weighing device 13, as shown in Figure 1. Accordingly, the skilled artisan would have used the teachings of the secondary references as better methods of weighing for that embodiment of Golecki.

Appellant further argues (Brief, pages 10-11) that "[t]he secondary references do not deal with a method of weight gain of a substrate in a CVI process or the weighing of an entire furnace" and, therefore, "are consequently not in the field of the applicant's endeavors." Appellant asserts (Brief, page 11 and Reply Brief, page 3) that the secondary references do not deal with the problem appellant was concerned with, namely determining the weight change in the parts during processing of the parts in a CVI/CVD furnace.

We agree with appellant that the secondary references may not be in appellant's field of endeavor. However, we disagree with appellant's characterization of the problem solved, and thus with the conclusion that the references do not deal with the same problem as that which concerned appellant. Appellant did not solve the problem of continuously weighing the parts during processing in a CVI/CVD furnace, as Golecki teaches such

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continuous weighing. The problem actually solved by appellant is more accurately weighing the parts inside the furnace. All of the secondary references deal with problems associated with weighing parts inside a vessel and/or with weighing parts in a heated environment (which would include a furnace). Accordingly, the secondary references all relate to weighing accuracy and, therefore, are analogous art according to the second criteria of *In re Clay*, 966 F.2d 656, 658, 23 USPQ2d 1058-59, 1060 (Fed. Cir. 1992), that the reference be pertinent to the particular problem being solved.

Appellant further states (Brief, page 11, and Reply Brief, page 5) that "[e]ven if the references were combined in the manner suggested by the Examiner, they still would not render obvious the Appellant's invention." However, appellant fails to explain exactly what would be missing if all of the references were combined as proposed by the examiner. Instead appellant (Brief, pages 11-12) summarizes what each reference discloses and then concludes that the combination would not be the same as appellant's invention. Such unsupported conclusions are not convincing.

Last, appellant (Brief, page 12) "submits that the Examiner is not one of ordinary skill in the art," and that the examiner

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consequently should not be allowed to rely upon "knowledge available to one of ordinary skill in the art." See also Reply Brief, page 5. We agree that a factual inquiry whether to modify a reference must be based on objective evidence of record, not merely conclusionary statements of the examiner. *See In re Lee*, 277 F.3d 1338, 1343, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002). Accordingly, "knowledge available to one of ordinary skill in the art" would be insufficient motivation to combine the references. However, although the examiner appears to rely upon such "knowledge," the examiner actually relies upon specific teachings in the references.

In particular, Yano at column 1, lines 39-42, and Spoor at column 1, lines 20-44, teach that devices measuring weight are adversely affected by changes in temperatures, thereby suggesting that the measurements of Golecki would be more accurate if done outside of the furnace. Further, Piroozmandi at column 2, lines 30-42, and Swartzendruber at column 1, lines 34-36, and column 2, lines 50-58, teach that the accuracy in weighing material inside a vessel is improved by measuring the weight of the vessel with its contents through installation of load cells under the vessel. Although both references deal with the weighing of bulk materials, when combined with the teachings of Yano and Spoor,

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they suggest that the entire furnace should be weighed rather than only the contents inside the furnace to increase the accuracy of the measurements. The level of the skilled artisan should not be underestimated. **See In re Sovish**, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir. 1985). Accordingly, appellant has not convinced us of any error in the examiner's rejection, and we will sustain the rejection of claims 1 through 14.

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## CONCLUSION

The decision of the examiner rejecting claims 1 through 14 under 35 U.S.C. § 103 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

**AFFIRMED**

Lee E. Barrett

LEE E. BARRETT  
Administrative Patent Judge

Anita Pellmar Gross

ANITA PELLMAN GROSS  
Administrative Patent Judge

Howard B. Blankenship

HOWARD B. BLANKENSHIP  
Administrative Patent Judge

BOARD OF PATENT  
APPEALS  
AND  
INTERFERENCES

AG/RWK

Appeal No. 2003-1362  
Application No. 09/178,399

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